CLAIMS

1. A system, comprising:

a) a gas turbine engine, which includes at least one annular flange extending from a turbine casing; and

b) a continuous annular heat shield, which

i) encapsulates the annular flange, and

ii) includes bellows or diaphragms which reduce the axial modulus of elasticity of the heat shield.

2. System according to claim 1, wherein the annular heat shield includes base edges adjacent the turbine casing, and the annular heat shield is impervious to gas flow, except possibly at the base edges.

3. System according to claim 1, wherein the annular heat shield is constructed of several adjacent units, each unit including

c) a mounting section in thermal contact with a first sector of the flange;

b) a hollow section surrounding a second sector of the flange, and separated from the second sector by a blanket of air; and

d) a bulkhead lying in an axial plane, which connects

the bracket section with the hollow section.

4. System according to claim 3, wherein the mounting sections are generally U-shaped in cross section, with legs of the U in thermal contact with the annular flange.

5. System according to claim 3, wherein the bulkheads flex during thermal expansion or contraction of the annular heat shield.

6. System according to claim 1, and further comprising spacers which extend between the heat shield and either the annular flange or the turbine casing, and which support the annular flange.

7. A system, comprising:

a) a gas turbine engine, which includes an annular flange extending from a turbine casing, the flange/casing having an axial modulus of elasticity defined therein; and

b) a heat shield, which

i) encapsulates a sector of the flange, and

ii) has an axial modulus of elasticity which is less than fifty percent of the axial modulus of elasticity of the sector.

8. Method of operating a gas turbine engine, comprising:

a) maintaining an annular body on an outer surface of a turbine casing;

b) maintaining an array of housings, each

i) encapsulating a respective sector of the annular body, and

ii) maintaining a blanket of air adjacent said respective sector;

c) maintaining an array of brackets, each

i) between a pair of housings; and

ii) in thermal contact with a respective sector of the body;

d) maintaining a gas seal between each bracket and its adjacent pair of housings.

9. Method according to claim 8, and further comprising:

e) maintaining bolts which extend through the annular body, each bolt fastening a bracket to the annular body.

10. Method according to claim 8, wherein the brackets, housings, and seals present a spatially continuous barrier to gases moving toward the annular body, except possibly at the radially innermost parts of the brackets, housings, and seals.

11. A system, comprising:

a) a gas turbine engine, which includes at least one flange extending from a turbine shroud;

b) an annular heat shield constructed of a sequence of hollow units, each unit surrounding a sector of the flange, and each unit comprising:

i) a first housing which surrounds a first sector of the flange, and

ii) a second housing which surrounds a second sector of the flange to define an air space between the second housing with the second sector.

12. System according to claim 11, wherein (A) the first housing is generally U-shaped in cross-section, and (B) legs of the U straddle the flange.

13. System according to claim 11, and further comprising bolts which extend through the first housings and through the flange, and which clamp the first housings into thermal contact with the flange.

14. System according to claim 11, and further comprising

c) a planar diaphragm, lying in an axial plane,

connecting an end of the first housing with an end of the second housing.

15. System according to claim 11, and further comprising:

c) bellows means within the heat shield for reducing the axial modulus of elasticity of the heat shield.

16. System according to claim 11, and further comprising a collection of spacers positioned between the annular heat shield and either the annular shroud or the flange, which spacers support the annular heat shield.

17. System according to claim 16, wherein an annular space exists between the annular heat shield and the flange.

18. A system, comprising:

a) a gas turbine engine containing a turbine shroud from which extends an annular body;

b) an annular heat shield encapsulating the annular body, comprising:

i) shell sections;

ii) deformable connectors between adjacent shell sections; and

iii) connectors for connecting the shell

sections to the shroud or annular body,
wherein each shell section captures a blanket of air adjacent the annular body.

19. System according to claim 18, wherein the connectors are U-shaped, and of smaller cross-section than the shell sections.